Poverty and insecure land tenure in cities have also driven urban residents back to the countryside to farm, log, or mine. This migration is clearly linked to outbreaks of diseases—typically not new organisms, but vector-borne endemic pathogens that find new pathways in humans. "We've seen many man-made malarial outbreaks, especially with the colonization of the Amazon. There was deforestation, dam construction, agriculture. The deforestation reduced the natural blood sources of mosquitoes and offered a new, [more easily available], and more concentrated human blood source," says Renato Gusmão, regional advisor of the communicable diseases program at PAHO. "Population dynamics under these conditions are poorly understood. But we see an unbelievable increase of transmissions in humans. We also see some very pernicious strains of resistant parasites."

Making a living. South Americans are learning that a commitment to the economy must go hand-in-hand with a commitment to health.

Malarial incidence in Latin America has remained stable at about 1 million cases per year. But in some gold-mining regions of Brazil, the annual parasite index (API) (infection rate per 1,000 population) is over 100, or 20 times the API of 5.8 for the whole region of Latin America. Colonization of forests and plains has led to numerous outbreaks of bacterial, parasitic, and viral diseases, including oropoche fever, a viral disease that has infected over 300,000 people in northeastern Brazil, and various types of rodent-borne hantaviruses that have caused epidemics in Colombia, Argentina, and Venezuela. Chagas disease, which can cause heart inflammation and enlargement of internal organs, is estimated to have affected over 16 million rural people and has been spread through blood transfusions, as have hepatitis, HIV, and syphilis. Public health centers are improving their screening of blood donors, but not all blood is screened.

Solutions

In Miami in 1994, and in Bolivia in 1996, heads of state for the American countries identified 65 initiatives in health, agriculture, urban and community life, water management, and energy use as part of an overall action plan for sustainable development. Long-term sustainability, experts say, will require a commitment to environmental health by all stakeholder communities including politicians, financial donors, the scientific community, and the public.

Nongovernmental organizations and international aid agencies are increasingly placing their hopes in community-based programs to help poor populations gain access to formal-sector services. Peri-urban communities in Lima have organized trash pickup teams, which pedal tricycle-like carts along fixed routes in the city's spreading slums. These enterprises, funded by the municipalities or directly by residents, serve as many as 250,000 people. In Belo Horizonte, Brazil, the PROFAVELA project helped squatter communities obtain land tenure and, thus, connection to municipal service networks.

Advances in many scientific disciplines also offer hope of improved prediction of disease and disaster outbreaks. An article by Rita R. Colwell published in the 20 December 1996 issue of *Science* described the way in which the warming of ocean surfaces, as in the El Niño phenomenon, can be a factor in cholera outbreaks. This knowledge could be combined with remote sensing techniques to help predict future outbreaks of cholera. International organizations, U.S. government agencies, and universities have embarked on a number of projects to design early warning systems for environmental health effects. "The rise in epidemics can be attributed to a set of factors—local, ecological, social, and global changes," Epstein says. "When factors act synergistically, one may see surprise upsurges in vector populations. We can use remote sensing to better understand habitat and climate forecasting to improve prediction of floods or droughts that provide conditions conducive to outbreaks. Ecological monitoring can help improve surveillance and response capability."

International financial and aid institutions are also focusing on multi-sector efforts. Working with laborers, industry, and the government, PAHO is helping to devise a regional strategy for workers' health. PAHO also promotes the use of inter-ministerial teams in health planning, in an effort to move beyond the strictly medical treatment aspects of health and seek more sustainable preventive solutions. "If [all the stakeholders] involved in mining work together on a plan for miners' health, for example, that's more effective than building a hospital," Cuneo says. He adds that in Latin America's new democracies, community involvement in political decision making, a necessary element for sustainability, has been slow in coming. "It's a long-term project, and it involves a learning process," he says.

Ultimately, addressing South America's environmental health problems may require a rethinking of the opinion that development should be viewed as it has been: in mostly economic terms, and through a short-term perspective. Latin Americans are beginning to realize that environmental sustainability, human health, and economic growth are not separate, but interlinked factors. Decisions made today on how to safeguard these factors will affect the well-being of Latin America's human capital for generations to come.

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Corrections and Clarifications

In the **Focus** article on alternative vehicles and fuels that appeared in the June issue of *EHP* ("A Driving Force," 105:582–587), two of the vehicles pictured on the first two pages were misidentified in the caption. The vehicle on the far left is the General Motors EV1, while the third vehicle from the left is the Chrysler PNGV.